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Dr. Raymond L. Orbach
Director, Office of Science
Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Dr. Orbach,

This letter accompanies the final report of the High-End Computing Subcommittee of the Advanced Scientific Computing Advisory Committee (ASCAC). The subcommittee's report responds to a charge made to ASCAC in August 2001 by Dr. James Decker, then Acting Director of the Office of Science, asking ASCAC to "assess the high-performance computational needs and capabilities throughout the Office of Science".

To address this charge, the High-End Computing Subcommittee, chaired by Professor Gregory McRae, was formed. Its report on "High-performance computational needs and capabilities in the Office of Science" draws on a sequence of activities, many involving ASCAC, that have taken place since the charge. In particular, reports from three ASCAC subcommittees (the subcommittee on facilities, chaired by Dr. Jill Dahlburg; the subcommittee on biotechnology, chaired by Dr. Juan Meza; and the subcommittee on large facilities, chaired by Helene Kulsrud) are the foundation for several of our conclusions and recommendations.

The present report was presented for approval at the most recent ASCAC meeting, which took place on April 5–6, 2004, and was approved unanimously. This letter and the report together constitute the official response from ASCAC to Dr. Decker's charge.

Broadly speaking, the High-End Computing Subcommittee report stresses the critical importance of computation to the future of science and engineering. This theme has appeared in several of your recent statements—for example, your March 2004 address to the American Physical Society titled "Computation Science: A Research Methodology for the 21st Century". As you will see, the report emphasizes our belief that substantial investments are needed in leadership-class computing as well as in programs that tightly couple science, high-end computing, and applied mathematics. The Department of Energy has a long and distinguished tradition of outstanding scientific and engineering research by multidisciplinary teams who work closely together. In this same spirit, ASCAC has consistently and strongly supported programs that build "a new sociology in science", as you state in your APS address.

Finally, I would like to express ASCAC's gratitude for your enthusiasm and energy, especially for your highly visible support of topics that are near and dear to our hearts—high-end computing, applied mathematics, computer science, computational science, and advanced networking.

Please let me know if there are any questions about this report, or if you would like further details about any aspect of the conclusions, recommendations, or background.

Sincerely,

Margaret H. Wright

Chair, Advanced Scientific Computing Advisory Committee